

GPS: Budgets Past and Future

by Dee Ann Divis



GPS programs did well in the recently approved fiscal year 2002 (FY02) budget cycle. And, although details are sketchy, no major program changes have appeared, as yet, in the President's proposed FY 2003 budget. Even so, revenue limitations could still make a zero sum game out of decisions regarding a new system architecture (GPS III) and upgrading the Block IIR and IIF satellites.

For FY02, the Department of Defense (DoD) got most of the money it requested for GPS — with one notable hit to the modernization budget — while the Department of Transportation (DoT) received a boost for both its aviation augmentation systems. Congressional changes to the original requests were limited, mostly tinkering around the edges of different program schedules.

It is too early to predict what will happen with the new budget. The White House presented its 2003 budget to Congress on February 4, and revisions always occur in the congressional review process. The potential for significant change remains, as officials weigh new defense needs, domestic safety, and the protection of critical infrastructure.

The war in Afghanistan has sharpened the focus on GPS-guided munitions and heightened the desire for aviation safety back-up systems. This latter concern could potentially reopen the debate over the Federal Aviation Administration's (FAA's) approach to air navigation and landing systems.

This is also an election year when the congressional urge to spend is nearly irresistible. Safety-related programs especially, such as GPS and navigation, are likely to receive favorable treatment after the September 11 terrorist attacks.

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But 2002 is also a dramatically different year for the nation financially. A year ago officials were still talking about budget surpluses and the affordability of a massive tax cut, since approved and implemented. Now spending is skyrocketing because of the war effort, the economy remains in the dump, and a pervasive topic of conversation in Washington, D.C., is the size of the deficit.

It's hard to predict whether expensive but historically troubled programs such as the Wide Area Augmentation System (WAAS) will be able to hold out against budget snipers. And Congress could still get the notion that GPS, which works so very well, might not need a lot more money for modernization just now.

Cuts May Hurt Modernization

The budget process, which never runs smooth and is almost always late, was truly derailed this year — first by the September 11 terror attacks and then by anthrax-laced letters that closed parts of Capitol Hill. The second quarter of fiscal year 2002 arrived before the last of the FY02 appropriations bills hit the President's desk.

The work got done, however, by means of eight temporary funding bills that kept agencies running while Congress and the White House sorted through new priorities. The DoT's FY02 appropriations bill was signed into law on December 18, with DoD's signed January 10.

The Pentagon received most of the money it sought, with the exception of some critical advanced procurement funds — the lack of which will likely affect the pace of GPS modernization.

DoD's GPS money falls under several different accounts, but particularly under the categories of Missile Procurement and

Research, Development, Testing and Evaluation (RDT&E). The most significant FY02 GPS budget cuts came in one of the major procurement accounts. DoD requested \$177.7 million in procurement funds for the space segment and \$23.8 million in advance-procurement money to support modernizing the IIR and IIF satellites.

The Senate agreed to both the requests, but the House whacked \$25 million off the space segment request and denied the advance procurement request entirely. In the end, DoD did get most of its request for the space segment, \$172.7 million, but received no FY02 money for advance procurement. A small space and control procurement account also received \$7.5 million with which to buy computers and other equipment.

The reason that the advance procurement money was lost stemmed from its designation for modifying the IIR and IIF satellites — that is, changing existing systems. This was determined to be an activity that should not be done under an advanced procurement account, according to Col. Douglas Loverro, system program director for the Navstar Joint Program Office (JPO). That work needs to wait until next year when it can be funded under an appropriate procurement account, he told *GPS World*.

Although the \$5 million cut in the space segment can be absorbed, defense sources say, the \$23.7 million slice in advanced procurement will hurt modernization. Most affected will be the ability of the JPO to modernize part of the IIR satellites with new civil and military codes. "It's going to be nip and tuck between when the money comes in and when you have to launch satellites, as to how many IIRs we'll be able to modernize," said Loverro.

It became clear a year ago, he explained, that the schedule would really only permit modernization of a maximum of 10 out of the remaining 12 IIR satellites. With the loss of the FY02 advanced procurement funding, the number of modernized IIRs (known as IIR-M) will likely drop to 8 to 10. The final number modified will depend on the failure rate of the on-orbit satellites, which are replaced as needed, and any future budget changes.

Two launches of unmodified IIRs will probably take place this year, the next in April on board a Delta II rocket, said Loverro. This launch was delayed from March because the launch vehicle is not ready.

In a twist you'd only find in Washington, the larger cut is less likely to affect the IIF satellites because advance procurement money earmarked for IIF "long-lead" items actually comes out of the fiscal year 2001

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budget. That FY01 money was not cut, so, the office has the funds to proceed.

As of press time, however, the JPO still needed permission — specifically, approval by the Office of the Secretary of Defense — to move forward on buying those long-lead items. The request for permission was submitted November 15, but approval was held up. The delay occurred because the program baseline document, which maps out purchases and deliveries, needed additional work and because the GPS III program was not fully funded. Fully funded, in this case, means money had not been allocated through the program's entire budget cycle, which stretches out to 2007.

Fortunately, the President included that "out year" funding (FY04 to FY07) in his FY03 budget. Defense sources told *GPS World* that the necessary approval to buy the long-lead items should be in place before publication of this article. Another question remains, however, concerning the number of IIF satellites that JPO will ultimately buy and have built by IIF contractor, The Boeing Company.

Accelerate GPS III?

DoD has received a total increase, or "plus-

up," of \$800 million for its programs through FY07. This increase, always subject to future tweaking by Congress, is reflected in the FY03 figures just submitted by the President.

According to Loverro, the money fully funds on-going efforts, mostly the IIFs, and includes funds to add power to the signals broadcast by the satellites. JPO has not decided exactly how it will handle the power enhancement versus GPS III question.

"That money may be to accelerate GPS III or it may be to go ahead and put more power on the current generation of satellites. That's a discussion that's still going on," Loverro told *GPS World* in an interview.

Only minor changes, if any, would be made to the IIR satellites because they are so close to launch. Moreover, major changes to the first set of six GPS IIF satellites appear unlikely. (Two sets of six satellites may be purchased.) The main question appears to be whether to truncate the second buy of IIFs, acquiring only three instead of six spacecraft, and then pushing ahead faster on the GPS III contract.

Loverro said that the decision on how to handle the power upgrades should be made by the end of February.

Once the decision on the power question is made, the final scope of the GPS III architecture contract remains to be seen. Though current plans are to pick two contractors for a second study phase, with one of the two almost certainly being tapped to build the new satellites, JPO may decide to select only one contractor for the next phase.

Whether or not to accelerate GPS III is a question of both money and program goals. At least one source, who asked not to be named, suggested that Congress might need to be tapped for more funding if JPO decides to go with two GPS contractors.

There are three companies hoping DoD makes up its mind soon — Lockheed Martin, the contractor for the IIRs, IIF contractor Boeing, and Spectrum Astro, a small but established satellite builder from Gilbert, Arizona, that holds other DoD space contracts. The first two companies also received DoD funding after first-round competition in 2000 for the first phase of the GPS III architecture study, and Spectrum Astro continued financing a GPS III proposal on its own. It is a sure bet that lobbying is fierce as each firm tries to beat the others out for a piece of this huge, long-term contract.

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DoD RDT&E Funds

DoD achieved even more success with its requests for GPS research, development, testing, and evaluation (RDT&E) funds. This budget is divided up into three areas: GPS III, user equipment and space and control.

The only real contention appears to have been over GPS III. DoD received the full amount it requested, \$78.3 million, although the House initially tried to cut the amount to \$66.4 million. Requests for user equipment and the ground control portion of the system (called space and control) were \$53.1 million and \$186.5 million, respectively. Both houses of Congress approved the full amounts without wrangling.

WAAS Gets a Boost

The Wide Area Augmentation System, which will provide GPS augmentation for aircraft navigation, has gone through the budget ringer in years past. In FY02 however, FAA not only obtained its full request of \$75.9 million for WAAS but received an additional \$5 million to begin the purchase of geostationary satellite services.

To reach the final figure, Congress adjusted upwards by \$500,000 the requested

amount for National Air Space (NAS) implementation and added more than \$1.6 million to technical engineering and program support. Congress cut funding for satellite communications services provided by two Inmarsat spacecraft by more than \$3 million.

FAA needs services from a third geostationary satellite and had planned to buy use of Telesat Canada's Anik F3 satellite. The business case for the Anik project has since faltered, however, leaving FAA uncertain if the satellite will ever be launched. The agency plans to award the \$5 million for services this fiscal year in a competitive procurement.

Dan Hanlon, WAAS is now six to eight months ahead of its most recently revised schedule, although the program is years past its original scheduled completion. The official date for acceptance of the WAAS system from contractor Raytheon remains September 2003, with commissioning of a fully operational system now projected in December 2003.

Between now and then FAA will continue to add the last two of eight integrity monitors — algorithms in the software — to ensure the safety of the system.

For FY03, FAA requested \$107.7 million

for its "mainline" budget, which pays for most of the development, satellite services, and oversight. Another \$3.1 million is in an account called Advance Technology Prototype. This money will fund some of the research by universities and consultants supporting WAAS development.

LAAS Does Well

The FAA's Local Area Augmentation System for precision approach and landing also did quite well in FY02, getting \$43 million. Up through FY02, LAAS funds were divided into development and production monies, potentially limiting management flexibility. That distinction will disappear in the FY03 budget, said an FAA spokesman.

In the FY02 budget, the House originally recommended \$42.5 million for LAAS, including a transfer of \$17.4 million from production funds into the development account, and an additional \$8.4 million to accelerate development. The Senate recommended substantially less money at \$16.7 million and set forth a program of earmarked spending.

In conference the House and Senate settled on a total of \$43.1 million for LAAS, all

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designated for development. They also directed FAA to report to them quarterly on LAAS progress and named five milestones they expect to see achieved during FY02: a Category I contract award by the fourth quarter, determination of category II/III integrity and continuity allocations between avionics and ground equipment, finalization of concept of operations required for FY03 development of airport procedures, LAAS capabilities integration in a certifiable avionics receiver; and development of a data collection plan and initiation of flight evaluations for development of complex LAAS approaches (for example, curved, segmented, offset).

The LAAS budget request for FY03 is \$55 million, according to another FAA spokesman.

NDGPS

Unfortunately the Nationwide Differential GPS (NDGPS) program did not do as well. The system, still under construction, aims to provide ground-based GPS augmentation for rail users, farmers, and others throughout the continental United States and Alaska. The network is a mixture of converted Air Force Ground Wave Emergency Network (GWEN) sites and new installations.

The Federal Railroad Administration (FRA), which sponsors NDGPS in cooperation with the U.S. Coast Guard, requested \$20.5 million in FY02, receiving only \$6 million through the Federal Highway Administration (FHWA). Much of that will go to operations, said one source, affecting the ability of program sponsors to continue adding to the network.

One of the problems NDGPS continues to face is the lack of a permanent fiscal home. Although FRA represents and champions the program, the money is actually transferred to the U.S. Coast Guard, which oversees the work. One year, the money was actually put directly into the USCG budget, another year it went through the FAA, and in FY00 the funds were funneled through FHWA.

In FY03, the \$6 million budget request is again going through the FHWA. That channel may put NDGPS at a disadvantage, suggests one observer, because of potential mission overlap and associated budget competition between NDGPS and proposed secondary missions for the FAA's aviation augmentation systems — particularly WAAS. A risk exists that the different programs may run afoul of each other, especially when Congress gets

hold of the debate. Whether an actual problem develops remains to be seen.

Change in the Wind?

As noted earlier, fiscal year 2003 is a most unusual budget year. While election years are always strange, the terror attacks and subsequent war have changed the tone of every single discussion on Capitol Hill.

In some ways the war has shown the value of GPS. Noted Loverro, "In Afghanistan, GPS-guided munitions have proven to be in many situations more accurate than laser-guided munitions." In other ways, however, recent events have highlighted systemic weaknesses. The Heritage Foundation, pointing to U.S. dependence on GPS to support critical civil and military services, suggested strengthening the role of DoD vis-a-vis the civil community.

Where policy is concerned, "follow the money" is a good guide; any change in program direction is almost certainly signaled during the budgetary process. The GPS community needs to be fully aware and organized to be sure it gets, and maintains, the capabilities it wants in the various GPS augmentations and modernization programs. ☼